

**Remarks**

Claims 164, 166, 170-174 and 196-198 are pending in the Application.

Claims 164, 166, 170-174 and 196-198 are rejected.

Claims 164, 166, 170-174 and 196-198 are amended herein.

Claims 199-229 are added herein.

Claims 164, 166, 170-174 and 196-229 are pending in the Application after the entry of the amendments herein.

**I. CLAIMS OBJECTED TO**

Examiner has objected to Claims 196-198 under 37 C.F.R. §1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Office Action, at 2.

Claims 196-198 had previously depended directly from Claim 172-174, respectively, and to facilitate prosecution, Applicant has rewritten Claims 196-198 in independent form.

While Claims 196 and 198 require “the single-wall carbon nanotubes [in the battery and fuel cell, respectively] are operable to store hydrogen that is stored in the [hydrogen storage device and fuel cell, respectively],” Claims 172 and 174 do not. Moreover, while Claim 197 requires “the single-wall carbon nanotubes [in the battery] are operable as a hydrogen storage device within the battery,” Claim 173 does not. For example, a hydrogen storage device can comprise a plurality of single-wall carbon nanotubes without them being used to store hydrogen (and thus, the single-wall carbon nanotubes are not operable to store hydrogen that is stored in the hydrogen storage device). This means that Claims 172 and 196 are of differing scope (because it is possible to practice one without practicing the other). Similarly, Claims 173 and 197 are of differing scope, as are Claims 174 and 198.<sup>1</sup> Therefore, these claims are not duplicate

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<sup>1</sup> Examiner's own position in the Office Action reflects the differing scope of these three pair of claims. Examiner has rejected Claims 173 and 174 as obvious on the grounds that “using SWNT's in a battery/fuel cell is an obvious expedient to exploit their electrical properties.” Office Action, at 2. Claims 197 and 198 (which had depended from

claims as defined by 37 C.F.R. § 1.75(c). *See* M.P.E.P. § 706.03(k) (recognizing that a difference in the scope of the claims is enough to show that they are not duplicate claims).

In view of the foregoing, Applicant respectfully requests that the Examiner withdraw the objection to Claims 196-198.

## **II. REJECTIONS UNDER 35 U.S.C. § 102/ § 103 OVER KIANG**

Examiner has rejected Claims 164, 166, 170-174 and 196-198 under 35 U.S.C. § 102(a) and (b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over Kiang *et al.* "Structural Modification of Single-Layer Carbon Nanotubes with an Electron Beam," *J. Phys. Chem.* **1996**, 100, 3749-3752, ("Kiang"). Office Action, at 2.

Examiner contends that the "reference teaches on pg. 3750 cut nanotubes. SWNTs are depicted, however, the discussion is general. In so far as claim 173, 174 require anything beyond nanotubes, then using SWNT's in a battery/fuel cell is an obvious expedient to exploit their electrical properties" *Id.*

Applicant respectfully traverses.

Regarding rejections under 35 U.S.C. § 102(a) and (b), anticipation requires each and every element of the claim to be found within the cited prior art reference. Regarding rejections under 35 U.S.C. § 103(a), to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *See* M.P.E.P. 706.02(j); *see also* *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438

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Claims 173 and 174 before being written in independent form) expressly require that the single-wall carbon nanotubes be used for their hydrogen storage capabilities, not their electronic properties.

(Fed. Cir. 1991).

Regarding Claims 164 and 166, *Kiang* does not teach or suggest a quantum device comprising conductors or an integrated circuit comprising a plurality of molecular wires, respectively, each of which requires cut single-wall carbon nanotubes integrated into conductors of the quantum device or into the molecular wires of the integrated circuit. Applicant has amended Claim 164 to include that the claimed quantum device comprises “a plurality of conductors, wherein the conductors of the quantum device comprise cut single-wall carbon nanotubes, wherein the cut single-wall carbon nanotubes of the conductors have a substantially similar length.” *Kiang* does not teach or disclose a quantum device, nor does it teach or disclose comprising a quantum device that has conductors, wherein the conductors comprise cut single-wall carbon nanotubes that have a substantially similar length.

Applicant has also amended Claim 166 drawn to an integrated circuit to include the element “wherein the cut single-wall carbon nanotubes have a substantially similar length.” *Kiang* does not teach an integrated circuit, nor does it teach an integrated circuit having a plurality of molecular wires wherein the molecular wires comprise cut single-wall carbon nanotubes wherein the nanotubes have a substantially similar length. There is no suggestion or motivation in *Kiang*, nor is there any suggestion or motivation in the knowledge generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at these claims of the instant invention. *Kiang* does not teach or suggest all the limitations of the claims. Applicant notes that *Kiang* provides no teaching, disclosure, or even a suggestion as to how to obtain single-wall carbon nanotubes having a substantially similar length. Thus, Claims 164 and 166 are neither anticipated nor *prima facie* obvious over *Kiang*.

Regarding Claims 170-174 and 196-198, Applicant has likewise amended Claims 170-174 and 196-198 to include the element “wherein the cut single-wall carbon nanotubes have a substantially similar length.” Further regarding Claims 170-174 and 196-198, *Kiang* does not teach or suggest an RF shielding device, a microwave absorbing material, a hydrogen storage device, a battery or a fuel cell, respectively, addressed by these claims. Nor does *Kiang* teach or suggest “purified and cut single-wall carbon nanotubes having a substantially similar length.”

Therefore, *Kiang* does not teach or suggest all the limitations of the claims. Applicant again notes that *Kiang* provides no teaching, disclosure, or even a suggestion as to how to obtain single-wall carbon nanotubes having a substantially similar length. Furthermore, there is no suggestion or motivation in *Kiang*, nor is there any suggestion or motivation in the knowledge generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at the elements of these claims of the instant invention. Thus, Claims 170-174 and 196-198 are neither anticipated nor *prima facie* obviousness over *Kiang*.

As noted above in the Office Action, Examiner contended "In so far as claims 173, 174 require anything beyond nanotubes, then using SWNTs in a battery/fuel cell is an obvious expedient to exploit their electrical properties." Office Action, at 2. Applicant again reiterates that all of the claims require more than just cut single-wall carbon nanotubes, which Applicant has pointed out consistently during the prosecution of this Application. As for Claims 173 and 174, these claims do require additional features, including that the cut single-wall carbon nanotubes are included in a battery (Claim 173) and a fuel cell (Claim 174). As *Kiang* does not teach, disclose, or suggest such limitations (of a battery or a fuel cell), no *prima facie* case of obviousness has been made. Applicant respectfully notes that a *prima facie* case of obviousness can only be made when the prior art reference (here *Kiang*) teaches or suggests all the claim limitations. *See M.P.E.P. 706.02(j).*

Therefore, in view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejection of Claims 164, 166, 170-174 and 196-198 under 35 U.S.C. § 102(a) and (b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over *Kiang*.

### **III. NEW CLAIMS**

Applicant has amended the claims to add new Claims 199-229. No new matter has been added by virtue of these amendments. Furthermore, each of these new claims depends from one of the independent claims discussed above. As all of the independent claims are in condition for allowance, so are the new dependent Claims 199-229.

Applicant : Richard E. Smalley *et al.*  
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Page : 12

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#### **IV. CONCLUSION**

As a result of the foregoing, it is asserted by Applicant that the Claims in the Application are now in a condition for allowance, and respectfully requests allowance of such Claims.

Applicant believes that it has concurrently herewith paid all fees required with this amendment and that no further fees are due. However, should any further fees be required, the Commissioner is authorized to charge such fees to Deposit Account No. 06-1050. Please reference Attorney Docket No. 21753-0012014.

Applicant respectfully requests that the Examiner call Applicant's attorney at number listed below if the Examiner believes that such a discussion would be helpful in resolving any remaining problems.

Respectfully submitted,

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